

I CLAIM:

1. An improved ram pump for use with a fluid source having an initial head, said ram pump being of the generally known type having:

- a) an intake manifold engagable with said fluid source, said intake manifold defining a waste outlet and a pump outlet therethrough;
- b) a waste valve member selectively moveable between a waste configuration whereat said fluid source is flowable through said waste outlet and a closed configuration whereat said waste valve member sealingly obstructs flow of said fluid source through said waste outlet; and
- c) a check valve member selectively moveable between a ram configuration whereat said check valve member substantially obstructs flow of said fluid source through said pump outlet and a pump configuration whereat said fluid source is flowable through said pump outlet;

wherein said ram pump is generally known to urge:

- d) said waste valve member towards said closed configuration when said check valve member is in said ram configuration and said waste valve member is in said waste configuration, and when said fluid source is at a first maximum head;

- e) said check valve member towards said pump configuration when said waste valve member is in said closed configuration and said check valve member is in said ram configuration, and when said fluid source is at a second maximum head;
- f) said waste valve member towards said waste configuration when said check valve member is in said pump configuration and said waste valve member is in said closed configuration, and when said fluid source is at a first minimum head; and
- g) said check valve member towards said ram configuration when said waste valve member is in said waste configuration and said check valve member is in said pump configuration, and when said fluid source is at a second minimum head;

wherein the improvement comprises:

- h) said waste valve member being selectively moveable along a path having a vertical component between said default waste configuration and said closed configuration, with said waste valve member being gravity-biased towards said default waste configuration; and
- i) said check valve member being selectively moveable along a substantially horizontal path between said ram configuration and said pump configuration, with said

check valve member being biased towards said ram configuration, wherein said fluid source is substantially horizontally flowable through said pump outlet when said check valve member is in said pump configuration.

2. An improved ram pump according to claim 1, wherein a tubular skirt portion extends in a substantially downward direction from a peripheral portion of said waste valve member.
3. An improved ram pump according to claim 2, wherein said path having a vertical component comprises a substantially vertical axis.
4. An improved ram pump according to claim 3, wherein said intake manifold includes a waste valve body and a manifold casing engagable with said fluid source, with said manifold casing securely engaging a lower end portion of said waste valve body, said waste valve body defining in throughpassing relation a waste conduit extending between said lower end portion and an upper end portion of said waste valve body, said waste conduit being in fluid communication with said manifold casing substantially adjacent to said lower end portion and in fluid communication with said waste outlet substantially adjacent to said upper end portion of said waste

valve body, and wherein said waste valve body includes an upper bearing mounted substantially adjacent to said upper end portion and a lower bearing mounted substantially adjacent to said lower end portion, with a longitudinal upper piston portion of said waste valve member extending in a substantially upward direction from a central portion of said waste valve member and engaging said upper bearing in throughpassing slidable relation, and with a longitudinal lower piston portion of said waste valve member extending in said substantially downward direction from said central portion of said waste valve member and engaging said lower bearing in throughpassing slidable relation.

5. An improved ram pump according to claim 4, wherein a peripheral cushioning member extends transversely from said longitudinal upper piston portion, with said peripheral cushioning member selectively engaging said upper bearing when said waste valve member is in said default waste configuration.
6. An improved ram pump according to claim 5, wherein said waste valve body defines a constricted portion of said waste conduit that is intermediate of said lower end portion and said waste outlet, said constricted portion having a seat portion, and

wherein said peripheral portion securely engages a peripheral O-ring member that sealingly engages said seat portion when said waste valve member is in said closed configuration.

7. An improved ram pump according to claim 6, wherein said substantially horizontal path comprises a substantially horizontal axis.
8. An improved ram pump according to claim 7, wherein said check valve member is spring biased towards said ram configuration.
9. An improved ram pump according to claim 8, wherein said check valve member comprises a check valve body and a valve cap member, said check valve body securely engaging said intake manifold substantially adjacent to said pump outlet, and wherein said valve cap member substantially obstructs flow of said fluid source through said pump outlet when said check valve member is in said ram configuration.
10. An improved ram pump according to claim 9, wherein said fluid source is substantially unobstructed by said check valve body when said check valve member is in said pump configuration.

11. An improved ram pump according to claim 10, wherein said lower end portion of said waste valve body sealingly and threadingly engages said manifold casing.
12. An improved ram pump according to claim 11, wherein said check valve body sealingly and threadingly engages said intake manifold substantially adjacent to said pump outlet.
13. An improved ram pump according to claim 12, wherein said upper piston portion has a threaded upper end portion, and wherein said peripheral cushioning member comprises a fastening member threadingly engaging said threaded upper end portion, a compressible pad member positioned about said upper piston portion and securely engaging said fastening member, and a reinforcing ring member securely engaging said compressible pad member, with said compressible pad member selectively engaging said upper bearing when said waste valve member is in said default waste configuration.
14. An improved ram pump according to claim 13, wherein said fluid source is flowable through said pump outlet into a pressure vessel when said check valve member is in said pump configuration, said pressure vessel defining a vessel outlet and containing a substantially impermeable bladder membrane

that is remotely positioned relative to both said pump outlet and said vessel outlet respectively, with said bladder membrane enclosing a buffer fluid that is elastically pressurized when said check valve member is in said pump configuration.

15. An improved ram pump according to claim 14, wherein said pressure vessel comprises a hollow vessel body and a vessel cap member, said hollow vessel body having a closed end and an open end and being in fluid communication with said vessel outlet, with said bladder membrane positioned within the vessel body adjacent said closed end, and with said vessel cap member sealingly and threadingly engaging said open end of said vessel body, and wherein said vessel cap member securely engages said intake manifold substantially adjacent to said pump outlet.

16. An improved ram pump according to claim 15, wherein said manifold casing, said check valve body, and said waste valve body are each respectively constructed from conventional valving mechanisms.